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EXAMINER	
SLOAN, NATHAN A	

ART UNIT	PAPER NUMBER
2614	

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14

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/543,480	SRINIVASAN, VENUGOPAL	
	Examiner	Art Unit	
	Nathan A Sloan	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 October 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 13-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 13-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *13*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. In response to the previous Office Action, applicant asserts that the amended independent claims place this application in condition for allowance. These new limitations and claims are addressed in the following rejections.

In response to applicants assertion that the amendment is intended to "broaden or clarify that the amended claims are intended to state the same thing as the claim prior to amendment (i.e., to have the same scope both before and after the amendment)..." is not clear. While examiner recognizes that this is not presented as an argument towards patentability, it is clear that applicant has specifically amended the present application to change the scope enough to allegedly overcome Fardeau and Jensen. This is apparent on p. 14-15, where applicant specifically argues that the new limitation of "overlapping" blocks is not taught by Fardeau or Jensen and therefore a rejection "cannot arrive at the combinations ... [and that] the rejections made in the Office action are flawed and claims 1, 15, 19, and 32, as well as all claims depending therefrom, must be allowed." Regardless, the new limitations necessitate the following new grounds of rejection as described in detail below.

Information Disclosure Statement

2. Examiner requests that applicant make a diligent effort to only submit citations relevant to the present invention. In the IDS filed 10/8/03, numerous references were filed having little or no relevance to the present invention. For example, Halko (2002/0055398) teaches a multilayer golf ball with wound intermediate layer, which lacks any relevance to the present invention directed to audio encoding. References are considered only to the extent deemed relevant by the examiner. For guidelines on submitting proper IDS, see MPEP 609.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-7, 15-22, and 27-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fardeau (5,574,962) in view of Jensen et al. (6,421,445).

With respect to claims 1, 5, 7, and 32, Fardeau teaches a system and method for adding an inaudible code to an audio signal. The claimed sampler for generating "a plurality of short blocks of sampled audio" wherein the short blocks have a "duration less than a minimum audibly perceivable signal delay" is met by data processing means 14 of Figure 1, which as taught in

column 6, lines 11-16 performs frequency range separation using a Fourier Transform. As taught in column 6, lines 21-25 one or more of the frequency bands are used to form a frequency component that encodes an identification message. These components are taught to have a "predetermined minimum duration," in column 6, lines 46-55 in order to make the encoded message inaudible. The claimed "frequency transformation arranged to transform the long block into a frequency domain signal comprising a plurality of independently modulatable frequency indices, wherein a frequency difference between two adjacent ones of the indices is determined by the minimum duration and the sampling rate," is performed by transform 16 of Figure 1 using a Fourier Transform. The claimed selector to select a neighborhood of frequency indices is met by selector 18, which selects a frequency component or "a neighborhood of frequency indices" with the lowest index and highest index being within a predetermined value is taught in columns 6, lines 34-40. Upon selection of an appropriate range or "neighborhood," an encoder 20 is used to "modulate two or more of the indices in the neighborhood" in order to add an inaudible code from generator 22 to the signal, where the code is made inaudible by having a predetermined duration. As taught in column 7, lines 29-35, notches B and C have an energy that is reduced to substantially zero meeting the claimed "extremum," and the code is modulated while still keeping the overall energy constant as taught in column 2, lines 39-40. Fardeau does not teach that the short blocks are overlapping as claimed. Jensen teaches using overlap in accordance with FFT methods in col. 14:38-51. It would have been obvious for one skilled in the art at the time of the invention to modify the system and method of Fardeau by using overlapping sample blocks in order to ensure complete frequency analyzing and limit the number of data samples needed as taught by Jensen in col. 18:40-44.

With respect to claim 2, Fardeau teaches in column 6, lines 5-10 that the apparatus is comprises a microprocessor with working memories meeting the claimed "digital computer having a buffer memory."

With respect to claim 3, Fardeau teaches the use of a Fourier Transform but not a Fast Fourier Transform. Jensen teaches the use of FFT in column 14, lines 41-46. It would have been obvious for one skilled in the art at the time of the invention to modify the methods of Fardeau by utilizing a FFT as taught by Jensen in order to provide a faster frequency transformation.

With respect to claim 4, the claimed increasing energy of a selected index and decreasing energy of a short associated block is taught in column 3, lines 17-22.

With respect to claim 6, the claimed composite signal comprising "a television broadcast signal and wherein the another portion of the composite signal comprises a video signal" is taught by Fardeau with the teaching in column 6, lines 1-4 of a television signal for a program, which inherently comprises video.

With respect to claims 15 and 19, the claimed sampling apparatus, processor, frequency transformation, and encoder are met as noted above in response to claim 1. Furthermore, the claimed "signal analyzer arranged to determine if the tone-like audio portion has a tone-like character within any one of the predetermined number of neighborhoods; and, encoder suspender arranged to suspend encoding of the encoder within any neighborhood in which the tone-like audio portion has a tone-like character" is not explicitly taught by Fardeau. Fardeau does teach data processing means 14 in column 7, lines 6-15 that analyzes energy in frequency bands to determine if energy is above a minimum value so as to avoid adding the code to the sound signal

during a period of silence. If a period of silence is detected, encoding is stopped. Fardeau, however, does not teach suspending encoding based on the detection of a "tone-like character," or the use of "overlapping" blocks. Jensen teaches in column 7, lines 54-61 performing tonal analysis based on a variety of values to determine if a section of a signal is suitable for masking a code. If the section is not determined to be suitable, coding is not performed in this region. It would have been obvious for one skilled in the art at the time of the invention to modify the encoding suspension methods of Fardeau by performing tonal analysis in order to ensure transmitted codes are not interfered with by certain tones and ensure that the coded word is inaudible to viewers. Jensen also teaches using overlap in accordance with FFT methods in col. 14:38-51. It would have been further obvious for one skilled in the art at the time of the invention to modify the system and method of Fardeau by using overlapping sample blocks in order to ensure complete frequency analyzing and limit the number of data samples needed as taught by Jensen in col. 18:40-44.

With respect to claim 16, the claimed composite signal comprising "a television broadcast signal" is taught by Fardeau in column 6, lines 1-4 .

With respect to claims 17 and 21, Fardeau teaches the use of a Fourier Transform but not a Fast Fourier Transform. Jensen teaches the use of FFT in column 14, lines 41-46. It would have been obvious for one skilled in the art at the time of the invention to modify the methods of Fardeau by utilizing a FFT as taught by Jensen in order to provide a faster frequency transformation.

With respect to claims 18 and 22, Fardeau does not teach carrying out a masking algorithm as described in ISO/IEC 13818-7. Examiner takes Official Notice that ISO/IEC

13818-7 is a well known standard. It would have been obvious for one skilled in the art at the time of the invention to modify the methods of Fardeau by analyzing signals according to ISO/IEC 13818-7 in order to conform to well known standards.

With respect to claim 20, the claimed composite signal comprising "a television broadcast signal and wherein the another portion of the composite signal comprises a video signal" is taught by Fardeau with the teaching in column 6, lines 1-4 of a television signal for a program, which inherently comprises video.

With respect to claim 27, the claimed broadcast measurement system in which an inaudible code is added to an audio signal and read within a statistically sampled dwelling unit is taught in column 1, lines 60-67 and column 2, lines 6-18. The claimed encoder and corresponding encoding methods are met by data processing means 14 of Figure 1 as noted in response to claim 1 above. The claimed receiver to acquire the encoded audio signal and decoder to read the code from the audio signal with a buffer memory to store "one of the short blocks" and "arrange to store a long block" is taught in column 7, lines 56-67 and column 8, lines 1-6 with data processing means 42 splitting up frequencies of the signal, selecting frequency components that include the encoded message, and detecting components that correspond to the code. This process is best understood with reference to Figure 3, which also shows memory 52 for storing coded data. Fardeau does not teach that the short blocks are overlapping as claimed. Jensen teaches using overlap in accordance with FFT methods in col. 14:38-51. It would have been obvious for one skilled in the art at the time of the invention to modify the system and method of Fardeau by using overlapping sample blocks in order to ensure

complete frequency analyzing and limit the number of data samples needed as taught by Jensen in col. 18:40-44.

Claim 28 is met as noted above in response to claim 6.

With respect to claim 29, the claimed "encoder comprising a frequency transformation arranged to transform the long block into a frequency domain signal" is taught in column 3, lines 23-30 with the use of a Fourier transform to split up a sound signal into frequency components, alter the energy of the components, and rebuild the sound signal for broadcast or recording.

With respect to claim 30, the claimed "receiver comprising a microphone" is taught in column 4, lines 21-30.

With respect to claim 31, Fardeau does not teach the claimed receiver comprising "an audio output jack." Examiner takes Official Notice that it is well know to include audio output jacks in receivers. It would have been obvious for one skilled in the art at the time of the invention to modify the methods of Fardeau by including an audio output jack in order to allow audio output of the received signal.

3. Claims 8-11, 13-14, 23-26, 33, and 34-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jensen et al. (6,421,445) in view of Lert, Jr. (4,677,466).

Jensen et al. (6,421,445) teach a system and method for including codes in audio signals.

With respect to claims 8, 33, 37, and 39, the claimed apparatus for reading a code / test value from an audio signal with a predetermined number of samples is met by DSP 266 of Figure 11. As taught in column 25, lines 36-48 the audio signal is separated into component ranges or bins using FFT processing. As seen in Figure 12B, data is gathered into memory 270 at step 454

until a sufficient number of audio samples have been stored for carrying out the FFT, taught in column 26, lines 60-63. A predetermined number of data points are used to form a predetermined number of frequency bins each having a predetermined width as taught in column 25, lines 39-47. The claimed "frequency transformation arranged to transform the one block into spectral data spanning a predetermined number of frequency bands, wherein each of the frequency bands comprises a neighborhood of frequency indices" is met by the FFT as noted above. The claimed processor and vote determiner to determine examiner predetermined frequency bands with a first block, if predetermined frequency indices have predetermined characteristics and to detect a "synchronization block if the predetermined frequency indices of a majority of the frequency bands ... have the predetermined characteristic," are met by DSP 266 and code determination logic circuit 320 which analyze frequency bands and determine if a synchronization symbol is present as taught in column 27. Multiple values are sampled to determined if a synchronization block / test value is indicated by matching for predetermined characteristics. Next a "second plurality of predetermined frequency bands ... associated with a second block" are analyzed, and if a majority of the indices are provided as inclusion in a data block based on a matching pattern, taught in column 29, lines 22-50 and column 31, lines 6-13. This process may repeat based on detection of a complete word as seen at step 496 to 450 of Fig. 12A. A comparison value is used to compare the encoded audio signal to determine the presence of a transmitted code element. This detection is carried out in accordance with FFT processing as noted above. Jensen teaches using a greatest number to provide a match (col. 31:6-13), but not explicitly a majority. Lert, Jr. (4,677,466) teaches a broadcast program identification method and apparatus which uses a majority of recognized signatures to determine a match as taught in

col. 10:39-45. If a majority is detected a code is determined, otherwise, a code is inherently not detected. It would have been obvious for one skilled in the art at the time of the invention to modify the system and methods of Jensen by using a majority to make a match as taught by Lert in order to ensure reliable data collection.

With respect to claims 9-11, the claimed frequency transformation being a FFT is met by Jensen as noted above, the claimed execution by a digital computer and the claimed processor operating under program control, which inherently contain algorithms / software including the above described vote determiner means, are taught in column 4, lines 40-57.

With respect to claim 13, the claimed reading a value k as the code bit if the k^{th} index is modulated is taught by reading modulated frequency indices, noted above, with a corresponding value of energy B(j) taught in column 25, lines 45-47. This may be performed in view of the Lert teachings for analyzing a majority as noted above.

With respect to claim 14, the claimed index pattern comprising a "pseudo-random sequences" is not explicitly taught by Jensen. However, it is the position of the examiner that this limitation is inherent. Jensen teaches comparing a code to the modulated indices as seen by the compare function 277 of Figure 13. The index patterns are "pseudo-random" in that they are a varying signal within a range that carry code signals.

With respect to claim 23, the claimed audience measurement system reading an inaudible code in a statistically sampled dwelling is seen in Figures 16 and 17. The claimed "encoder arranged to add a predetermined code bit to each frequency band in a predetermined plurality of frequency bands within a bandwidth of the audio signal" is met by encoder 348 of Figure 16, which performs operation of adding an inaudible code according to the flowchart seen in Figures

7A through 7E. The claimed "receiver within a dwelling arranged to received the encoded audio portion" is met by a digital computer which is arranged with a decoder "to acquire a respective test value from each of the frequency bands ..., to compare the acquired test values, to determine that one of the test values is the code only if that test value is acquired from a majority of the frequency bands ... and to otherwise determine that none of the aquired test values is the code" is taught in column 5, lines 10-34, column 29, lines 22-50, and column 31, lines 6-13 and noted above in response to claim 8. Jensen does not explicitly teach the claimed use of a majority. Lert, Jr. (4,677,466) teaches a broadcast program identification method and apparatus which uses a majority of recognized signatures to determine a match as taught in col. 10:39-45. It would have been obvious for one skilled in the art at the time of the invention to modify the system and methods of Jensen by using a majority to make a match as taught by Lert in order to ensure reliable data collection.

With respect to claim 24, the claimed audio signal being part of a television broadcast signal is taught in column 33, lines 32-35.

With respect to claim 25, the claimed receiver including a microphone is met by microphone 386 of Figure 17.

With respect to claim 26, Jensen does not teach the claimed receiver comprising "an audio output jack." Examiner takes Official Notice that it is well know to include audio output jacks in receivers. It would have been obvious for one skilled in the art at the time of the invention to modify the methods of Jensen by including an audio output jack in order to allow audio output of the received signal.

With respect to claim 34, the claimed first and second plurality containing the same frequency bands is met by Jensen by determining a synchronization block and upon detection of the block examining the frequency band for following data as noted above.

With respect to claim 35, the claimed code being a binary number is taught in col. 11:4-10.

With respect to claim 36, the claimed binary number being represented by "a position of an index having a predefined characteristics" is met by matching binary code elements to predetermined characteristics, namely predetermined codes. However, as noted above, Jensen does not teach examining a majority. Lert, Jr. (4,677,466) teaches a broadcast program identification method and apparatus which uses a majority of recognized signatures to determine a match as taught in col. 10:39-45. It would have been obvious for one skilled in the art at the time of the invention to modify the system and methods of Jensen by using a majority to make a match as taught by Lert in order to ensure reliable data collection.

With respect to claim 38, the claimed pattern being uniquely associated with a respective code bit is met by determining if patterns as previously noted and seen in Figs. 12B, see col. 28-29.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan A Sloan whose telephone number is (703) 305-8143. The examiner can normally be reached on Mon-Fri 7:30am - 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Miller can be reached on (703)305-4795. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-HELP.

NAS

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